Some Macroeconomic Puzzles: Conjectural Refutations

The Carry Trade: pennies from heaven?

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"Oh every time it rains
It rains pennies from heaven
Don't you know each cloud contains
Pennies from heaven"

Pennies from Heaven, 1936

‘might be going up by the stairs and in danger of going down in an escalator’

‘they might be picking up nickels in front of a steamroller’

Traders’ Aphorisms

• The first involved the belief in weather-related money making schemes or “sunspots”
• The second that some returns are being collected at the risk of some large shock – insurance premia, like the ‘man from the Pru’
• 100 pennies a day means that the house on the left is worth £12,175 more than the one on the right!
Uncovered Interest Rate Parity

\[ I_{t,k}^* - I_{t,k} = E_t (e_{t+k} - e_t) + \varepsilon_t \]

2% - 1% = 1% + error

\( I_{t,k}^* \) is the foreign interest rate, \( I_{t,k} \) is the domestic interest rate and \( e_t \) is the foreign price of domestic currency.

• In either common currency the return up to some random error should be the same
• Sterling return is 2% but depreciates 1% against the Euro
• Euro return is 1% and appreciates 1% against Sterling
• But consistently we find the common currency return of the higher interest rate dominates....
The ‘Law of One Price’

- A single traded good should cost the same in any common currency
- A composite traded good should also cost the same
- Any undervaluation or overvaluation gives scope for trade to change prices or for the exchange rate to adjust to correct deviations

FT Cover prices: 30/31st January in European and Asian Editions
The FT and the ‘Law of One Price’

- Compare the posted FT exchange rate versus the 1st February close
- Euro Data not so far
- ...but Asian Data suggest some revaluations coming...e.g. Korea or Indonesia
Purchasing and Interest Rate parity combined

£10 machine produces £1 per year @10%

Euro20 machine produces Euro2 per year @10%

- Exchange Rate 2:1
- Now if prices of production are expected to rise in the Euro by 25% and the exchange rate is going to fall by 25% to 2.5:1
- Then the Euro machine price will fall until 2.5/(new price)-25%=10%
• Exchange Rates not well predicted – “disconnect” e.g. Meese and Rogoff
• Hold the high yield because that does not lead to systematic depreciations
Empirics of Carry Trade

• Burnside et al. (2008) is typical and they find that over a period of mostly floating rates and capital account liberalisation, 1976--2007, a monthly carry trade portfolio, up to 20 currencies, earned an average annual excess return of about 5%.

• This significant return is smaller than the average excess return on the stock market over this same period of around 7% and we examined the equity risk premium in the previous lecture.

• But the carry trade returns seemed to be much less variable than equity returns, with an annualized standard deviation of about 5% compared to 15% for equities.

• The way to compare returns across different portfolios is to divide the excess return over the risk-free interest by the standard deviation portfolio returns, which gives us the return per unit of risk and is called the Sharpe ratio. We can see that the Sharpe ratio of the carry trade is double that for equities and hence very attractive.
The Yen Carry Trade

NZ Dollar should depreciate for return equality

East Asian Financial Crisis
BoJ QE
Lehman Bros. bankruptcy
QE 1
QE 2
QE 3
The QE Carry Trade

Aussie Dollar should depreciate for return equality
An Unhedged, Simple Trade Carry Result

<table>
<thead>
<tr>
<th>Dates</th>
<th>Average Return</th>
<th>Standard Deviation</th>
<th>Average Interest Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-2015</td>
<td>0.63653291</td>
<td>4.246339309</td>
<td>0.438357077</td>
</tr>
<tr>
<td>1994-2000</td>
<td>0.405536214</td>
<td>4.010553509</td>
<td>0.535699104</td>
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<tr>
<td>2001-2005</td>
<td>1.183543462</td>
<td>2.781640752</td>
<td>0.48575878</td>
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<tr>
<td>2006-2010</td>
<td>0.244837346</td>
<td>5.537247722</td>
<td>0.458507824</td>
</tr>
<tr>
<td>2011-2015</td>
<td>0.827744503</td>
<td>4.367771974</td>
<td>0.237843882</td>
</tr>
</tbody>
</table>

Yen Carry Trade

<table>
<thead>
<tr>
<th>Dates</th>
<th>GBP to AUD Average</th>
<th>YEN to AUD Average</th>
<th>USD to AUD Average</th>
<th>Euro to AUD Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>0.329867388</td>
<td>0.773897639</td>
<td>0.414702159</td>
<td>0.677072435</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>3.107408135</td>
<td>4.238498865</td>
<td>7.821301284</td>
<td>2.765073714</td>
</tr>
<tr>
<td>Interest Diff.</td>
<td>0.248683748</td>
<td>0.276524974</td>
<td>0.277222479</td>
<td>0.272555295</td>
</tr>
</tbody>
</table>

‘QE’ Carry Trade

- A positive return in the funding currency explained by both the interest rate differential and the depreciation of the funding currency
- Whole period of low Japanese Rates vs New Zealand Dollar...or...
- Ultra low rates since 2009 vs Aussies.
No positive 45 degree line – perhaps negative
Explanations…Excuses…Reasons

• Excess Returns related to measureable risk
• Reward for bearing disaster risk
• Peso Problems
• Financial Frictions e.g. liquidity
• Impact of uncertainty on continuing profits
• Intermediation by firms
• Monetary policy
What if risks are not normally distributed?

- Higher returns required for skewed distribution of returns
• Liquidity or informational constraints may keep premium alive
Money and Monetary Policy

I
• Money has a rate of return that is negative in inflation and yet it is held
• Currencies that are expected to appreciate but don’t are also held
• Lack of safe assets in the world – faux safe havens
• Allows the interest rate on funding currencies to be too low given subsequent returns

II
• Asymmetric monetary policy rule in high yielder
• Expected depreciation when interest rates are high
• But then systematically prevents by changing interest rates or operating forex policies
• Helps explain excess returns in high yielding economy
Concluding Remarks

• Possible solutions have led to marked departure from simple arbitrage-free position

• Measured risk and Knightian uncertainly may play a role

• The net foreign asset position provide a clue to risk – as well as the impact on the economy from these trades

• But incomplete markets awash with informational and trading frictions may prevent full arbitrage from being complete…the penny drops…